

**Raptor Population Index III:  
*A scientific system to monitor  
North American raptors***

**Final Report  
To  
National Fish and Wildlife Foundation**

**Project # 2007-0005-000**



*Northern Harrier (Circus cyaneus)*

**July 1, 2007 to June 30, 2008**

***A joint project of Hawk Mountain Sanctuary Association  
Hawk Migration Association of North America  
and HawkWatch International, Inc.***

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**A Final Programmatic Report to  
National Fish and Wildlife Foundation  
On Project # 2007-0005-000**



**July 1, 2007 to June 30, 2008**

**Submitted by  
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## **Acknowledgements**

Report photos provided by David McNicholas, Laurie Goodrich, Vic Berardi, and Ernesto Ruelas Inzunza. Cover credits: Northern Harrier and American Kestrel by D. McNicholas; Mississippi Kite by V. Berardi. We thank contributors, advisory committee members, and partner organization staff for successful completion of the Raptor Population Index III.

**Raptor Population Index III:  
A scientific system to monitor  
North American Raptors  
*Final Report on Year Three***

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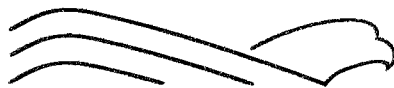
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HMANA



HAWK MOUNTAIN



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## National Fish and Wildlife Foundation Final Programmatic Report

**Project Name and Number:** Raptor Population Index III (PA) (2007-0005-000)

**Recipient Organization/Agency:** Hawk Mountain Sanctuary Association

**Recipient Organization Web Address:** [www.hawkmountain.org](http://www.hawkmountain.org)

**Date Submitted:** September 15, 2008

### 1) Summary of Accomplishments

The project's key accomplishments were to produce the first peer-reviewed scientific assessment and report on the status of North American diurnal raptors. The report findings were presented to 250 scientists and resource managers at the international Raptor Research Foundation meeting held in September 2007 in Allentown Pennsylvania. Subsequently, a book was produced and released in spring 2008 summarizing the conservation status of 20 species of migratory raptors as well as the regional trends for three continental regions: northeast, gulf coast, and western U.S. and Canada. Finally, the Raptor Population Index results and database were integrated into several existing avian population database online networks including the Avian Knowledge Network (AKN) to allow for future real-time examination of raptor population trends. Trend results were shared with the public through press releases and popular articles.

### 2) Project Activities & Results

#### *Logic Framework from Proposal:*

Activities →	Project Outputs →	Post-Project Outcomes →	Indicator →	Baseline Value →	Predicted Value of Project Output →	Predicted Value of Post-Project Outcome
Write conservation status reports for each species of North	A timely synthesis of the status of each species of migratory raptor with	An improved awareness of the status and trends in North American migratory	Number of scientists and managers understanding current raptor status for the continent and	0-10 biologists and managers	100 scientists and managers from agencies	300 scientists, managers, conservationists, public

reports for each species of North American migratory raptors*	migratory raptor with recent trends presented for continent and by region. Summary of historical change in population and recent conservation threats included.*	American migratory raptors by managers, scientists, and the general public*	status for the continent and region		agencies	
Expand citizen scientist network of sites contributing to the long-term RPI database, with emphasis on improved geographic coverage*	Broader geographic coverage of counts sites contributing data to the RPI database*	Improved ability to provide regional trend assessments for raptor populations in North America.*	regions with 10-years or more trend data from > 3 sites/ region	None	Three-four regions	6-10 regions for continent
Review and refine RPI website to share results from species conservation status assessments and provide updates every two years.*	Functional, user-friendly web-based mechanism to distribute results of RPI analyses to public and contributing observers as well as the conservation and scientific community.*	Establish RPI as a leader in providing timely, web-based, scientifically valid trend estimates for North American raptors. Meeting the goal set by Partners in Flight*	no. of species and regions with interactive trend estimation on RPI website	None	8-12 species in three regions	web-based trends for 18 species for 4-10 regions
Hold major scientific meeting with	Increased awareness of the status of North	Increase in monitoring & research efforts where	number of species with regional and continental	2-3 species	8-12 species at continental level	12-18 species in 6-10 regions

focus on status of North American Raptors, to focus scientific attention on RPI results.*	American raptors and the gaps in knowledge that scientists or managers need to focus attention on filling.*	needed and to improve monitoring ability and to identify causes of declines and conservation threats.*	trends available to scientists in timely manner			
Disperse results of status reports widely to general public with press release and media blitz held in conjunction with the national scientific meeting on the status of NA raptors.*	Greater public awareness of raptor status and attention to conservation threats with articles in newspapers, magazines and web-based media.*	Improved knowledge by general public of raptor trends with knowledge leading to increased focus and support for raptor conservation. Better local support for RPI network watch sites, sustaining RPI network for long-term.*	number of public and conservation groups with timely knowledge of raptor population status for spp.	0-10 conservation groups for 2-5 species	1000 people and 10 groups for 12 species	1500+ people and 10-30 groups for 18 species

***Raptor Population Index III Activities:***

The overall project goal was to produce a scientific assessment of conservation status and population trends using migration count data sets from across the continent integrated with other sources of population status information. And, the project set out to make that information available widely. During this project, the overall goal and primary activities as defined above were largely completed.

Goal One: In the *State of North America's Birds of Prey* (Bildstein et al 2008; and enclosed with this report), we presented the conservation status assessment for 20 species of



North American diurnal raptors. Trends and status are presented for three regions and continent-wide. Possible threats are highlighted as well. This report was presented to 250 scientists, hawk watchers, and resource managers in September 2007 at the Raptor Research Foundation meeting. And, copies of the report mailed to each attendee in June 2008. The availability of the report was announced with a press release, and a popular summary of the trend results will be disseminated widely later in 2008. Goal indicators were fully achieved.

Goal Two: During the course of this project, additional migration watch sites were incorporated into the HawkCount database and the geographic coverage of watch site data expanded to include additional sites in Mexico, eastern and western United States. Currently, greater than 200 sites contribute data seasonally to the migration count database (see [www.hawkcourt.org](http://www.hawkcourt.org)) and at least 30 with greater than 10 years of data available. The RPI partners, Hawk Migration Association of North America, has been working to derive site descriptions of each site in the web database and to encourage additional sites to enter data in hourly format which is best for scientific trend assessment. The exciting accomplishment is that nearly all hawk migration watch sites in North America are now using the HawkCount system and data are archived and pooled for future trend assessments and/or research. We also were able to analyze trends for 22 sites in three regions. The challenge is finding and covering new sites in regions not currently well covered by watch sites and in better understanding how watch sites may be grouped into 'regions' or 'corridors' for scientific assessment of population trends. Further research on migration corridors and catchment areas is needed to begin to define regions. The indicator goals were achieved and will be expanded each year.

Goal Three: During the project we made significant progress on development of a web-based system for deriving and sharing population trends of raptors with public and conservation agencies. The challenge has been in taking our human-based scientific, peer-reviewed model (see Farmer et al. 2006), and making it more automated in a web-based system. To do this, we worked with the Avian Knowledge Network (AKN, based at Cornell Lab of Ornithology) and Bird-Studies Canada (BSC) whom have been working to automate population trend information from the Canadian Migration Monitoring Network. Through AKN, hawk count data were made available to BSC and the regression models shared with BSC scientists. Graphic capabilities from AKN were used to present RPI results for our new updated web site and we worked to make data networks better integrated. Meetings with Partners in Flight, Northeast Continental Bird Monitoring group, Cornell Lab of Ornithology, and other partnerships established RPI as an important tool in monitoring land bird populations. Although we have not yet completed an interactive web-based tool for presenting raptor population trends, during the project we made important steps towards that goal. The scientific trend assessment model had to be translated into a new statistical language (R ) so that it could be shared on the web. That step is in process and will need scientific review and testing before release. At that point, we will be able to provide interactive trend results for the 20 species across the continent. We anticipate this will be accomplished within the next year.

Goal Four: Results of the RPI analyses were presented at an international joint conference of the Raptor Research Foundation and the Hawk Migration Association of North America in September 2007. Greater than 250 scientists, students, managers and birdwatchers attended the sessions. The meeting was successful in highlighting the project results and conservation

status of 20 species of raptors. The species found to have the most wide-spread declines was further highlighted with a special symposium on the American Kestrel. The results of that symposium will be published during 2008. In the future, further research on defining catchment areas and regions will allow greater attention to regional patterns in trends for each species. Project indicators were achieved.

Goal Five: In spring 2008, we disseminated a press release on the release of the report, *State of North America's Birds of Prey* and especially highlighted the decline in American Kestrels. The report has been made available through a book seller, Buteo Books and advertised to ornithologists. Free copies were mailed to selected scientists or managers. A short four-page summary of the findings is being prepared for release later in 2008. That report will be mailed to conservation agencies, outdoor writers, and press contacts to further disseminate the findings and stimulate conservation activities or attention. The delay in achieving this goal was necessary as we had to wait until the book was published to begin publicity work. Publication took longer than originally anticipated. We have disseminated the results through our website, but direct mailings will be completed later in 2008.

One of the most significant steps achieved during Raptor Population Index III is the wide-spread acceptance of it as the main system for monitoring raptor populations and the integration of the statistical approach into current systems being developed to monitor migrant songbirds. Both the hawk-watcher and the wildlife manager are now looking to RPI to provide conservation information on diurnal raptors.

### 3) Lessons Learned

One lesson we learned is that many steps take longer than anticipated. Volunteer-based monitoring systems are cost-effective and attractive; however data entry and protocols are not something volunteers do easily. Such steps may be better designed for paid personnel. In addition, translating scientific statistical models into interactive, web-based, user-friendly monitoring tools is challenging. Automating decision steps and model selection are just some of the challenges. By integrating the RPI project into ongoing and evolving networks such as the Avian Knowledge Network, we ensured its longevity and viability and opened the door to other useful partners. Other conservation agencies or groups with monitoring data may follow our model and not attempt to develop new unique approaches but integrate with other networks to make data available and useful. The mapping tools and graphic tools developed at AKN will be useful in display of raptor migration data.

#### **4) Dissemination**

Project results were shared widely with the public and scientific community through presentations, publications, and press releases during 2007 and 2008. Some of the results are also on display on the rpi website or through other websites (see [www.rpi-project.org](http://www.rpi-project.org)).

Further enhancements are in development to allow queries and graphic data presentation in near future.

#### **5) Project Documents**

Attachments and photographs are enclosed in hard copy and on an enclosed CD respectively. The main product of this project is the book, State of North America's Bird of Prey. Two copies are enclosed with this report.

*Report prepared by: Laurie J. Goodrich, [goodrich@hawkmtn.org](mailto:goodrich@hawkmtn.org)*

## **APPENDIX**

1. ***State of North America's Birds of Prey* Table of Contents**
2. **Press releases from the project, April 2007 to July 2008**
3. **2007 Annual Report to contributors and hawk watchers**
4. **List of Outreach activities for RPI III**
5. **Book entitled *State of North America's Birds of Prey* enclosed with final report.**

## Raptor Population Index (2007-0005-000) Outreach Activities

### *June 2007 to July 2008*

**Field site visits** (n=14), 1 June 2007-30 June 2008. Field trips have several purposes: (1) Establish personal communication with site coordinators, (2) Recruit submissions of data to HawkCount.org, particularly from underrepresented regions such as the Midwest, (3) Obtain selected historical datasets that are in paper forms to aid in data transfer, (4) Obtain data collection protocols from sites, when they exist/stimulate the adoption of HMANA's data collection protocol/collect information on operation of sites, including photographic documentation.

<b>Date(s)</b>	<b>Site/state</b>	<b>Contact</b>
10 August 2007	Chimney Rock and Duke Farms NJ	Chris Aquila
23-24 August 2007	Braddock Bay NY	David Bonter
13 September 2007	Hawk Mountain PA	Laurie Goodrich
15 September 2007	Duke Farms NJ	Chris Aquila/John Kee
11 October 2007	Illinois Beach State Park IL	Janice Sweet
12 October 2007	Eagle Valley WI	Brett Mandernack
13 October 2007	Hitchcock Nature Center IA	Mark Orsag
18 October 2007	Harvey's Knob VA	Joyce Holt, Bill James
18 October 2007	Rockfish Gap Hawkwatch VA	Brenda Tekin, Gordy Adamsky
19 October 2007	Snicker's Gap VA	Todd Day
20 October 2007	Powdermill PA	Bob Muhlvihill, Mike Lanzone
21 October 2007	Allegheny Front PA	Angelo Mincone
3 November 2007	Waggoner's Gap PA	Dave Grove
28 March 2008	Ripley Hawkwatch NY	Gil Randell

**Public Programs** (n=8) – promotion of the RPI project or programs to highlight the results of “State of North America’s Birds of Prey” (programs given by Ernesto)

<b>Date</b>	<b>Location</b>	<b>Program/host</b>
7-9 September 2007	Boston MA	<i>The RPI and declines in the American Kestrel</i> Eastern Massachusetts Hawkwatch
13 September 2007	Fogelsville PA	<i>Papers in the symposium “State of North America’s Birds of Prey,” a one-hour tutorial on HawkCount.org, and a one-hour program on Data Collection Protocols</i> RRF-HMANA conference
2-7 October 2007	Patuxent Wildlife Research Center MD	<i>The Raptor Population Index Project</i> Northeastern Coordinated Bird Monitoring
3 November 2007	Waggoner's Gap PA	<i>The Raptor Population Index Project</i> Program for members of DC Audubon
5 November 2007	Ithaca NY	<i>Cayuga Bird Club Monday Night Seminar:</i>

		<i>"The State of North American Birds of Prey"</i> Cornell Lab of Ornithology
12-16 February 2008	McAllen TX	<i>Monitoring with a conservation goal: principles and practice of raptor migration monitoring</i> Fourth International Partners in Flight Conference
16-18 March 2008	Hadley MA	<i>Large-scale monitoring of migrating hawks</i> Northeastern Coordinated Bird Monitoring
29 March 2008	Presque Isle PA	<i>The State of North America's Birds of Prey</i> Presque Isle Audubon Society

#### PUBLICATIONS AND OUTREACH

**Press releases** (Environmental News Network <http://www.enn.com/>) (attached):

-- *International Conference on Hawks and Other Raptors to be Held in Pennsylvania in September* (Published June 21, 2007 02:49 PM)

-- *Ground-breaking Report Provides First Continental Assessment of North American Raptor Populations* (Published June 19, 2008 11:44 AM)

**White papers and direct-mailing reports:**

Anonymous. 2007. The Raptor Population Index 2007 Annual Report. Produced by the RPI Partnership, HMANA-HMS-HWI. Ithaca, NY. 6 p.

Northeast Coordinated Bird Monitoring Partnership. 2007. *A Framework for Coordinated Bird Monitoring in the Northeast*. Northeast Coordinated Bird Monitoring Partnership Report. 62 pp. Available online at <http://www.nebirdmonitor.org/framework>.

**General audience articles:**

Ruelas I., E. 2008. The Raptor Population Index: taking the pulse of raptor migration. *Birding* 40:58-68

**Peer-reviewed publications:**

Farmer, C.J., D.J.T. Hussell, and D. Mizrahi. 2007. Detecting population trends in migratory birds of prey. *The Auk* 124(3):1047-1062

Bildstein, K.L., J.P. Smith, E. Ruelas I. and R.R. Veit (Eds.) 2008. *The State of North America's Birds of Prey*. Nuttall Ornithological Club and American Ornithologists' Union. Series in Ornithology No. 3. Cambridge MA and Washington DC.

#### PARTICIPATION IN NETWORKS

**Northeastern Coordinated Bird Monitoring** (<http://www.nebirdmonitor.org/>) – Preparation of white paper “A framework...” (above), coordination (with David Mizrahi) of Migratory Bird Group, preparation of grant proposal for regional monitoring for the Regional Conservation Needs initiative of multistate conservation grants (USFWS Region 5).

**Citizen Science Toolkit** – Metadata of HawkCount.org and RPI as citizen science project (<http://www.birds.cornell.edu/citscitoolkit/projects/vertebrates>).

**Avian Knowledge Network** (<http://www.avianknowledge.net/content/about/partners>)

HawkCount.org has submitted nearly 750,000 observational records to the AKN data warehouse

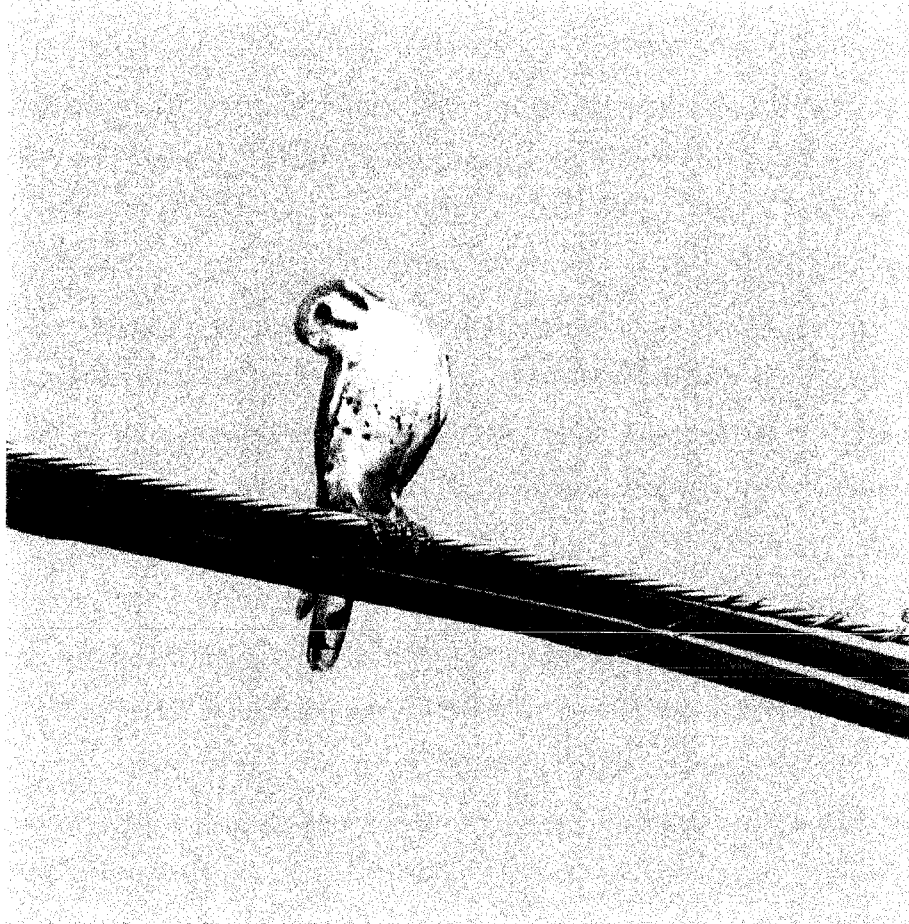
(sixth most important data contributor, from a total of 43 partners), these data have also been made available to The Global Biodiversity Information Facility (<http://www.gbif.org/DataProviders/providerslist?sortBy=records>). I contribute to the development of the AKN through weekly conference calls of the AKN developers group.

**Global Raptor Information Network**

(<http://www.globalraptors.org/grin/SiteNews.asp?lNewsType=1>) The RPI project and its outcome has been used in the creation of the Global Raptor Information Network database.

**Rainforest Alliance Ecoindex** (<http://www.eco-index.org/new/index.cfm>), of nature conservation projects is creating a profile for the RPI Project, to be uploaded very soon.

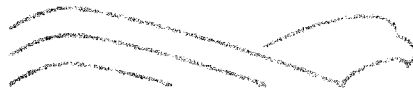




*American Kestrel (Falco sparverius)*



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INTERNATIONAL